fact, the meteorological observatories thruout Italy are not strictly a part of the meteorological service. There is a meteorological observatory in the building of the Collegio Romano, where the central bureau is located, but the observatory is merely a part of the astronomical observatory of the Collegio Romano, and has a director who is a professor in the institution. There is also a meteorological observatory on the Capitoline Hill, which is, I understand, maintained by the municipality of Rome. Observatories similar to these are scattered thruout Italy, and report their observations to the central bureau thru an arrangement with either their institution or municipality.

In the forecast room a general working chart and supplementary temperature and pressure charts are used, as well as a chart showing the general conditions of the previous evening. The telegraphic reports are not received completely until about noon, and the forecasts are issued about 2 p. m. for all Italy, for the ensuing twenty-four hours. The printed daily publications embrace tabulated bulletins and weather maps quite similar to those issued in other European meteorological offices. The subscription price in Italy is 16 francs per year.

There seemed to be nothing special to note in connection with the instrumental equipment of the meteorological observatory visited. The recording hair hygrometer was found in use here also, but Doctor Palazzo said it was not giving satisfaction, contrary to the opinion received in other places. The wet and dry-bulb thermometers in the shelter were located on the roof on a stationary standard, but a fan was placed near the bulbs so that when a spring was wound up the air was set in motion, the effect being quite similar to that secured by our whirling apparatus. There is a large number of small stations in Italy where research work is being done, and special attention is now being given to the meteorological conditions in the tobacco fields. One of the divisions of the central bureau, directly under Professor Morti, has charge of the observations of earthquakes.

I had been informed by many during my visit that the winter was the coldest experienced during the past twenty-five years, and I was interested to learn what a comparison with the actual record would show; but I was not surprised to learn from Doctor Palazzo that the winter was very nearly normal. I have frequently been imprest, in my own experience, with the fact that people forget easily about the past, especially when weather is concerned, and I was rather interested in finding the same conditions obtaining abroad.

My trip from Naples to Mount Vesuvius on January 14 was made partly with the hope of visiting the observatory after my descent from the crater, but as I reached the funicular railway station, near which the observatory is located, I found my train, the last of the day, was about to start on the return trip, and I had but a passing glimpse of a Robinson anemometer and a thermometer shelter on the outside of this far-famed observatory.

In my traveling southward thru Italy I was much imprest with the increasing barometric pressure, and during my stay at Naples the barometer was uniformly at 30.5 inches. Sailing from that port on January 16 westward to Gibraltar there was practically no change in the reading of the barometer, and the weather continued much the same as in Italy. After passing by the "big rock" out into the Atlantic, bound for New York, I naturally expected the ship to turn in the direction of the port of destination. The course, however, lay to the south of west until the parallel of 35° was reached at 22° west longitude, passing about 300 miles south ot the Azores. The course was thence directly west along this parallel as far as 60° west longitude, when it was changed to the northwest toward New York. This is the regular course of the Mediterranean fleet, and masters are required by the regulations of their companies to follow it during the winter season, as it lies along the permanent "high" where storms are infrequent. In fact the winds were light and gentle during the greater part of this trip across the ocean, and the weather was quite summerlike, until the course turned to the northwestward across the Gulf Stream. This was in strong contrast with the stormy weather experienced on the northern route on my voyage eastward. During the summer season, however, when storms are infrequent, the sailing course of these vessels from Gibraltar is nearly in a direct line passing north of the Azores. New York was reached on January 31, 1907.

A BENEFICENT SCIENTIFIC MISSION.

The Syrian Protestant College at Beirut was founded in 1863 and opened in 1866, thru the efforts of North American Presbyterian missions. Complete courses are given in commerce, medicine, and biblical archæology. Formerly the Arabic language was used, but now English is used, and many Beirut students have wandered over to the United States. Among the faculty are Rev. George E. Post, of New York, the professor of surgery; Dr. A. E. Day, of natural sciences, and Robert H. West, of mathematics and astronomy.

The Lee Observatory was founded in the year 1874 for special astronomical studies. The meteorological record began in June, 1874. The record is maintained by the students and assistants, of which there is a large number, under the especial oversight of the director. The officials responsible for this series are therefore as follows: 1874–1882, Rev. C. V. A. Van Dyck; 1882–1884, Dr. Jaris Nime; 1884–1899, Prof. Robert H. West; 1899 to date, Raymond S. Dugan. The observatory is on a high, rocky ridge that extends toward the north and northwest, above the sea. It is in latitude 33° 54′ 20″ N., and longitude 35° 28′ 10″ E. The cistern of the barometer is at present 35 meters above sea level. This series of observations, now continued for over thirty years, is the longest and most important in any portion of the Turkish dominion. From the beginning observations have been made three times a day, originally at 9 a. m., 3 and 9 p. m., but now at 8:30 a. m., 2:30 and 8:30 p. m. Since February, 1894, a Richard barograph has been in operation, and from some earlier date a Richard thermograph also. The observations have been published quite regularly in the annual volume of the Central Institute of Austria. The data for Beirut and Jerusalem afford almost the only basis we have for a statistical study of the climate of Palestine, and it is proper to say that we still need additional observatories in that region, especially a station on the summit of Mount Carmel, which is only 1400 feet above sea level (latitude 32° 51′ N., longitude 34° 58′ E.), and is easily made habitable.

May we not hope that all medical and educational missions will do as much for science as is anyway practicable. Especially may all missions imitate the example of the Jesuits in the Philippine Islands, where a great system for the study of climatology and for forecasting storms has been established by them. Such general applications of science contribute to the material progress and welfare, and hence to the intellectual and religious development of a nation, quite as much as any other form of activity. In modern times the first departure from a purely theological or religious mission was the establishment of medical missions, of which we have notable examples in the work of Dr. Peter Parker, at Canton, and George E. Post, at Beirut. Whatever missions can do for the intellectual and physical welfare of the nations is a truly noble work, and we must look upon a well organized weather bureau as most beneficent in all its relations to the people.

INTERCONVERSION OF CENTIGRADE AND FAHRENHEIT DEGREES.

As many American and English meteorologists find difficulty in thinking in the centigrade system, we call attention to

a convenient formula and rule lately devised by Doctor Hellmann by which one may convert centigrade to Fahrenheit, or vice versa, with the least possible trouble. Ordinarily we say that one degree on the centigrade scale is nine-fifths of one degree on the Fahrenheit scale, but the multiplying by nine and dividing by five is awkward, and Doctor Hellmann simply substitutes eighteen-tenths for nine-fifths, and then instead of this writes 2 — 2/10. In this way any number of degrees on the centigrade scale is converted to the equivalent number on the Fahrenheit scale by first multiplying by two and then subtracting from this product one-tenth part of itself; for example, 17 centigrade is 34 — 3.4 = 30.6. Fahrenheit. Some may prefer to modify the operation as follows: From the original number subtract one-tenth of itself and then multiply by two. Thus 17 C. — 1.7 = 15.3, which multiplied by 2 equals 30.6. We have still to add 32°, making in all 62.6°, in order to get the temperature on the Fahrenheit scale.

The conversion from Fahrenheit to centigrade, according to Hellmann's rule, is not quite so simple, as he writes the formula as follows: $(\frac{1}{2} + \frac{1}{2} \cdot \frac{1}{10} + \frac{1}{2} \cdot \frac{1}{100}$, etc.) (F.— 32). The first factor in the parenthesis is equivalent to 0.5555 + = 5/9. For most persons it is easier to divide by 2 than to multiply by 5, and the formula may be written

$$C. = \tfrac{1}{2}\ (F. - 32)\ (1 + \tfrac{1}{10} + \tfrac{1}{100} + \tfrac{1}{1000}\ \text{etc.},) = \tfrac{1}{2} \cdot \tfrac{10}{9} (F. - 32).$$

The computation is made as in the following example: $\frac{1}{2}(62.6 - 32) = 15.3$; and $15.3 + 1.53 + .153 + .0153 + .00153 = 16.99983 +$, or 17.0.

Probably this and other methods have already been used by persons in England and America.

METEOROLOGICAL WORK AT CAMP WELLMAN, DANES ISLAND, SPITZBERGEN.

The Wellman Chicago Record-Herald Polar Expedition was organized about the first of January, 1906, to carry out Mr. Walter Wellman's plan of reaching the North Pole by means of an air ship or dirigible balloon.

Mr. Henry B. Hersey, Inspector, U. S. Weather Bureau, having volunteered for the service, was assigned by Prof. Willis L. Moore, Chief of the Bureau, to accompany the expedition as meteorological observer. He was also appointed by the National Geographic Society of America to act as the representative of that organization with the expedition. About May I, 1906, Mr. Hersey accompanied Mr. Wellman to London and Paris, assisting him in the organization of the work and the assembling of the equipment. A little later he was appointed executive officer of the expedition, second in command. This appointment was accepted and Mr. Hersey was directed to take charge of the first section, sailing from Tromsoe, Norway, to Danes Island, Spitzbergen, with the force and material for the erection of the living quarters, workshop, balloon house, and gas plant. This section of the expedition was made up of eighteen men and sailed from Tromsoe June 15 on the steamer *Frithjof* and arrived at Danes Island on the 21st.

The meteorological instruments were landed and put in position on June 25, 1906, and regular observations began on the 26th. The outfit consisted of standard U. S. Weather Bureau maximum, minimum, and dry thermometers, also a whirling hand psychrometer (a sling psychrometer), consisting of dry and wet-bulb thermometers on one support. There were also a standard Weather Bureau anemometer and single register, a Richard thermograph, an aneroid barometer, and a Richard meteorograph, recording temperature, barometric pressure, humidity, and wind velocity. The thermometers were installed in a latticework shelter of standard Weather Bureau pattern (small size).

The anemometer was first put up on a pole, attached to a building known as Pike House, at an elevation of about 38 feet above the ground and 46 feet above sea level, and back about 70 feet from the water front of Virgo Harbor. The thermometer shelter was erected on a little knoll about 150 feet west of Pike House and about 70 feet back from the water front.

The exposure of the thermometers was entirely satisfactory, but that of the anemometer was poor. About 200 yards south of Pike House there is a steep hill rising to over 300 feet in height, and to the west about 600 yards another ridge of hills about 500 feet high; to the northwest across the strait, or Dans Gat, as it is called, Amsterdam Island rises to a height of about 500 feet. To the east and northeast the exposure is open to the wind.

No standard rain or snow gage was used, but the amount of precipitation was estimated or approximately measured in an improvised tin-can gage by Mr. Hersey, and as he has had more than twenty years' experience in meteorological work and his estimates were carefully made, his figures may be considered approximately correct.

The latitude and longitude of the station were determined by Mr. Hersey and Mr. Felix Riesenberg, assistant scientific observer of the expedition, to be as follows: latitude 79° 43′ north, and longitude 11° 9′ east from Greenwich. The time used in the records of the station is one hour faster than Greenwich.

On July 5 the steamer *Laura*, a private steamer with a hunting party on board, stopt in the harbor. She had on board a mercurial barometer which was being sent from the observatory at Christiana to Jan Mayen Island for use in meteorological work there. It appeared to be in good condition, and the aneroid in use at this station was compared with it and found to agree closely. On July 11 the barometer was moved to the new Wellman House, about 300 yards northwest of Pike House. This made a change in the elevation of the barometer from about 12 feet to about 25 feet above sea level.

August 10 the anemometer was moved from Pike House to the top of the frame work of the gas apparatus, near Wellman House. This made a change in the height of the cups above the ground from 38 to 40 feet and above sea level from 46 to 54 feet. The exposure was somewhat improved by the change.

August 18 the thermometer shelter was moved from near Pike House to a new location near Wellman House, about 300 yards northwest of its former site. A good exposure was obtained.

August 19 a standard U. S. Weather Bureau 4-foot wind vane was erected on top of Mount Moore, about 400 yards southwest of Wellman House, and at an altitude of about 500 feet above sea level. This gave an excellent exposure for obtaining the true direction of the wind.

DAILY METEOROLOGICAL JOURNAL FROM JUNE 21 TO AUGUST 31, 1906.

June 21.—Expedition arrived on steamer *Frithjof* and dropt anchor in Virgo Harbor at 7 p. m., after a hard fight thru the heavy ice in Dans Gat. Snow flurries prevailed thruout the day and following night.[1] Estimated snowfall at 6 p. m., 3.0 inches. Temperature below freezing all day. Dans Gat and harbor full of heavy pack ice.

June 22.—Snowing all day with a brisk northwest wind. Snowfall, 2.0 inches. Below freezing all day.

June 23.—Another day of snow flurries, but not so heavy. Snowfall, 1.0 inch. Freezing all day.

[1] The terms "night", "evening", "morning", are apparently used to designate the periods to which they are applied in the United States; it is plausible that the term "night" is used for the period during which the men were sleeping and no note was taken of weather conditions. At latitude 79° 43′ the sun would remain above an unobstructed horizon from about April 14 to about August 29, while twilight would not give way to full darkness till after the autumn equinox. See also the entry of August 27.